Open Access Article. Published on 17 December 2024. Downloaded on 2/12/2026 1:15:36 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

Nanoscale Advances

An open access journal publishing across the breadth of nanoscience and nanotechnology

rsc.li/nanoscale-advances

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

IN THIS ISSUE

ISSN 2516-0230 CODEN NAADAI 7(1) 1–374 (2025)

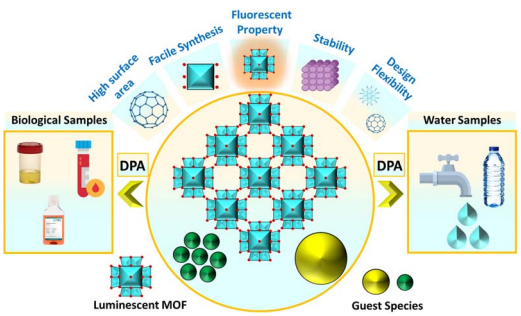
Cover
Image credit: Thom Leach/ Science Photo Library/Getty Images.

REVIEWS

13

Synthesis and applications of luminescent metal organic frameworks (MOFs) for sensing dipicolinic acid in biological and water samples: a review

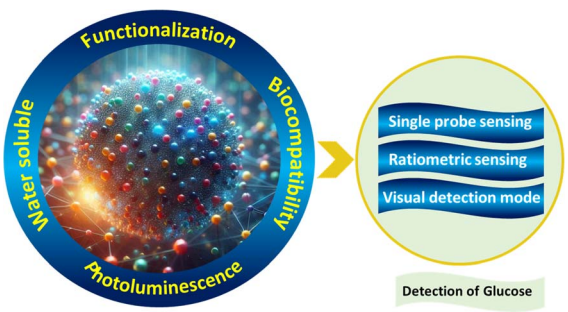
Kawan F. Kayani,* Omer B. A. Shatery,* Sewara J. Mohammed, Harez Rashid Ahmed, Rebaz F. Hamarawf and Muhammad S. Mustafa



42

Carbon dots: synthesis, sensing mechanisms, and potential applications as promising materials for glucose sensors

Kawan F. Kayani,* Dlzar Ghafoor, Sewara J. Mohammed and Omer B. A. Shatery



ROYAL SOCIETY OF CHEMISTRY

View Article Online

GOLD OPEN ACCESS

EES Batteries

Exceptional research on batteries and energy storage

Part of the EES family

Join in | Publish with us

rsc.li/EESBatteries

Registered charity number: 207890

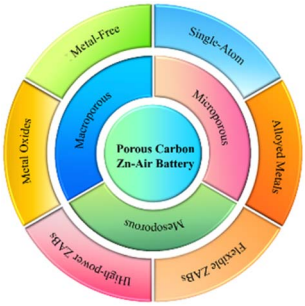
Open Access Article. Published on 17 December 2024. Downloaded on 2/12/2026 1:15:36 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

REVIEWS

60

Porous carbon-nanostructured electrocatalysts for zinc–air batteries: from materials design to applications

Sanshuang Gao, Maolin Li, Nianpeng Li, Lei Zhang,* Qian Liu, Xinzhong Wang* and Guangzhi Hu*

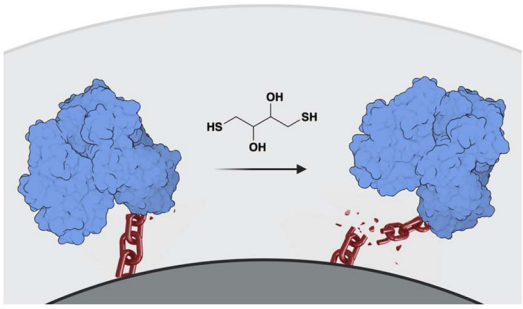


COMMUNICATIONS

89

Reduction-responsive immobilised and protected enzymes

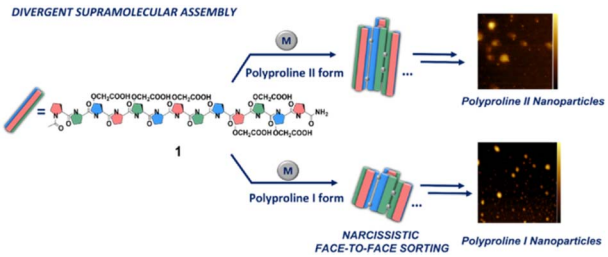
Congyu Wu, Seyed Amirabbas Nazemi, Natascha Santacroce, Jenny A. Sahlin, Laura Suter-Dick* and Patrick Shahgaldian*



94

Sequence-controlled divergent supramolecular assembly of polyproline helices into metallo-peptide nanoparticles

Dominic F. Brightwell, Kushal Samanta, Julie A. Watts, Michael W. Fay and Aniello Palma*

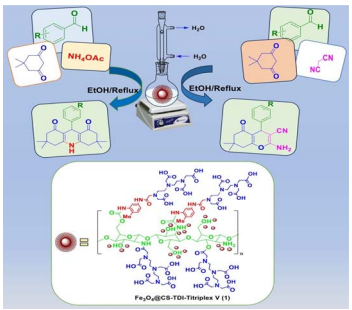


PAPERS

99

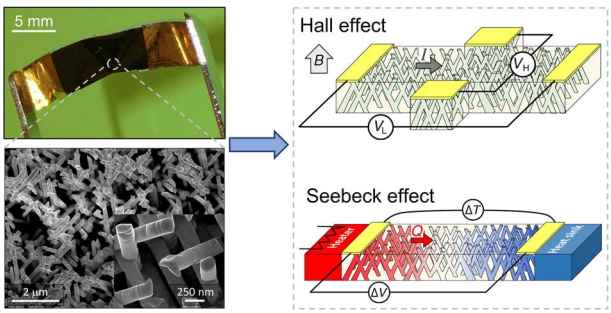
A supramolecular magnetic and multifunctional Titriplex V-grafted chitosan organocatalyst for the synthesis of acridine-1,8-diones and 2-amino-3-cyano-4*H*-pyran derivatives

Najmeh Hassanzadeh, Mohammad G. Dekamin* and Ehsan Valiey



Open Access Article. Published on 17 December 2024. Downloaded on 2/12/2026 1:15:36 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

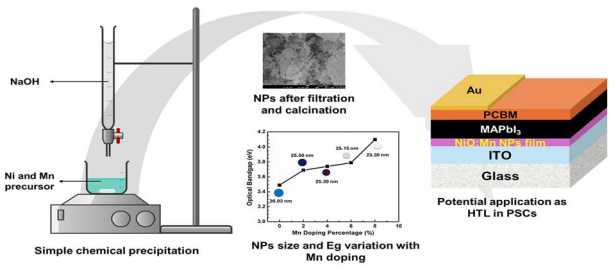
124



Improved electrical and thermoelectric properties of electrodeposited $Bi_{1-x}Sb_x$ nanowire networks by thermal annealing

Luc Piraux,* Nicolas Marchal, Pascal Van Velthem, Tristan da Câmara Santa Clara Gomes, Flavio Abreu Araujo, Etienne Ferain, Jean-Paul Issi and Vlad-Andrei Antohe*

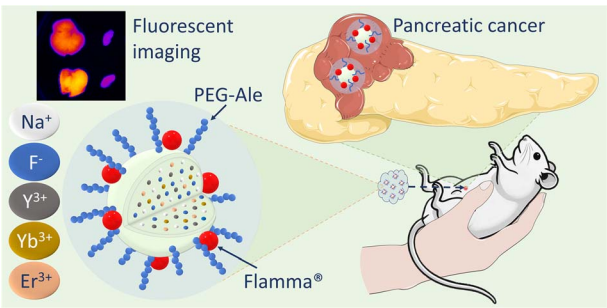
133



Modulating Mn-doped NiO nanoparticles: structural, optical, and electrical property tailoring for enhanced hole transport layers

Robiul Islam, Rahim Abdur, Md. Ashraful Alam, Nadim Munna, Aninda Nafis Ahmed, Mosharof Hossain, Mohammad Shahriar Bashar, Dipa Islam and Mohammad Shah Jamal*

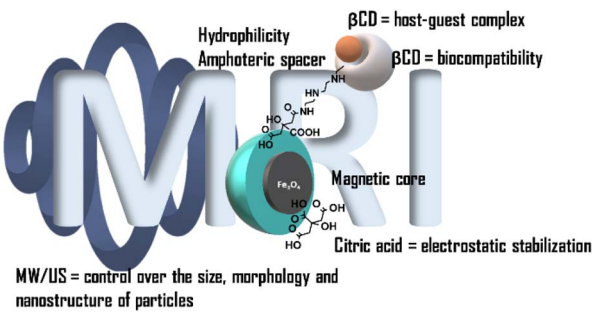
144



Intraperitoneal *versus* intravenous administration of Flamma®-conjugated PEG-alendronate-coated upconversion nanoparticles in a mouse pancreatic cancer model

Taras Vasylyshyn, Vitalii Patsula, David Větvička, Oleksandr Shapoval, Jan Pankrác, Martina Kabešová, Jiří Beneš and Daniel Horák*

155



Amphoteric β-cyclodextrin coated iron oxide magnetic nanoparticles: new insights into synthesis and application in MRI

Federica Calsolaro, Francesca Garello, Eleonora Cavallari, Giuliana Magnacca, Mikhail V. Trukhan, Maria Carmen Valsania, Giancarlo Cravotto, Enzo Terreno* and Katia Martina*

This journal is © The Royal Society of Chemistry 2025

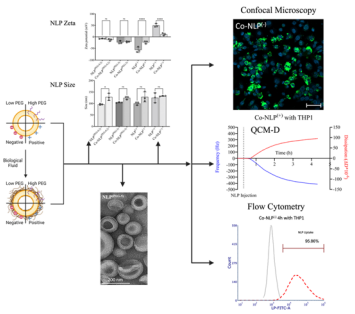
Open Access Article. Published on 17 December 2024. Downloaded on 2/12/2026 1:15:36 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

PAPERS

169

An investigation of the effect of the protein corona on the cellular uptake of nanoliposomes under flow conditions using quartz crystal microgravimetry with dissipation

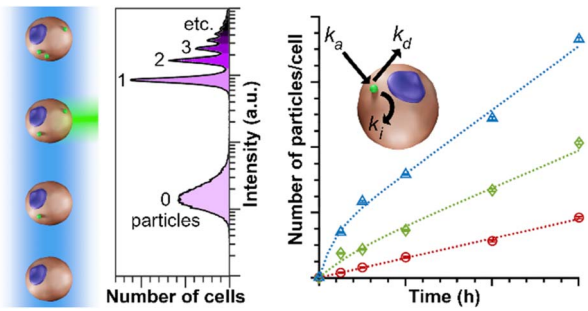
Nicholas Van der Sanden, Radu A. Paun, Michael Y. Yitayew, Oscar Boyadjian and Maryam Tabrizian*



185

High-throughput approach to measure number of nanoparticles associated with cells: size dependence and kinetic parameters

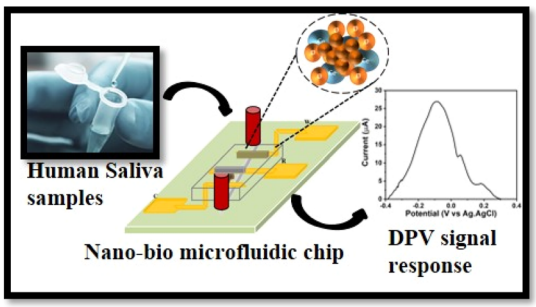
Ceri J. Richards, Paula Melero Martinez, Wouter H. Roos and Christoffer Åberg*



196

An electrochemical immunosensor based on a nano-ceria integrated microfluidic chip for interleukin-8 biomarker detection

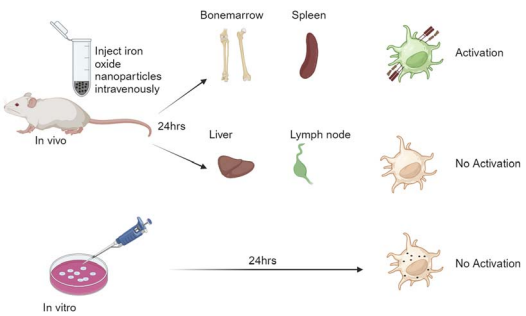
Hema Bhardwaj, Zimad Hashmi, Avinash Kumar Singh, Gautam Kumar, G. B. V. S. Lakshmi and Pratima R. Solanki*



209

Dendritic cell activation by iron oxide nanoparticles depends on the extracellular environment

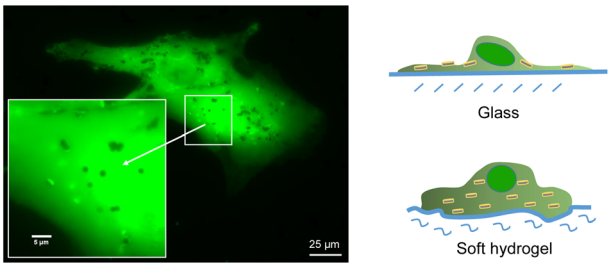
Mason Song, Robert Ivkov and Preethi Korangath*



Open Access Article. Published on 17 December 2024. Downloaded on 2/12/2026 1:15:36 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

PAPERS

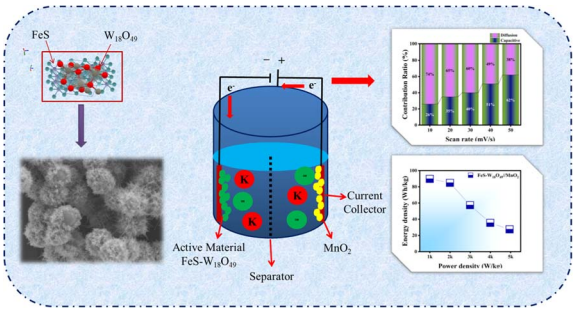
219



Substrate softness increases magnetic microdiscs-induced cytotoxicity

Andrea Visonà, Sébastien Cavalaglio, Sébastien Labau, Sébastien Soulan, Hélène Joisten, François Berger, Bernard Dieny, Robert Morel and Alice Nicolas*

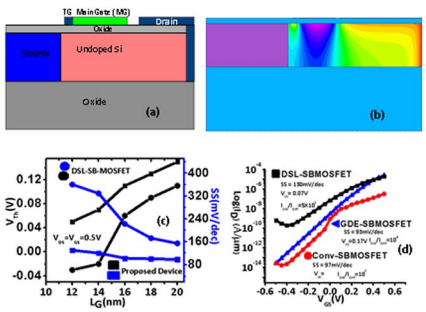
231



First investigation of high-performance FeS-based $W_{18}O_{49}$ asymmetric supercapacitors operating at 1.6 V

Junaid Riaz, Fawad Aslam, Muhammad Arif,* Tabasum Huma* and Amina Bibi*

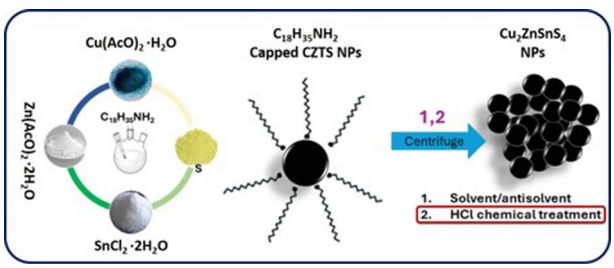
242



Optimized nano-scaled drain- and gate-engineered Schottky barrier MOSFET with improved ambipolarity and RF characteristics

Faisal Bashir,* Ali S. Alzahrani and Furqan Zahoor

250



Optimized hot injection and HCl purification for high quality Cu_2ZnSnS_4 nanoparticles

Amin Hasan Husien,* Giorgio Tseberlidis,* Vanira Trifiletti, Elisa Fabbretti, Silvia Mostoni, James McGettrick, Trystan Watson, Riccardo Po and Simona Binetti

This journal is © The Royal Society of Chemistry 2025

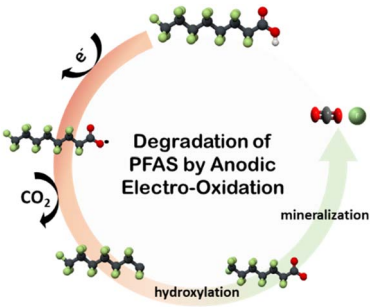
Open Access Article. Published on 17 December 2024. Downloaded on 2/12/2026 1:15:36 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

PAPERS

261

Electrochemical advanced oxidation combined to electro-Fenton for effective treatment of perfluoroalkyl substances "PFAS" in water using a Magnéli phase-based anode

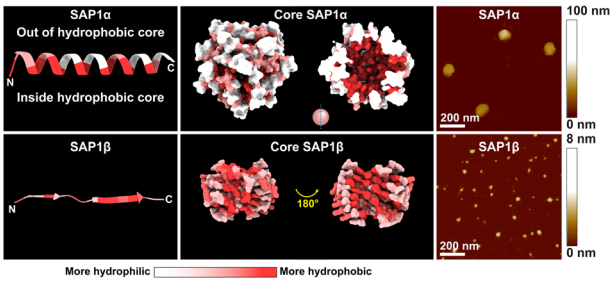
Chaimaa Gomri, Elissa Makhoul, Fatou Niang Koundia, Eddy Petit, Stéphane Raffy, Mikhael Bechelany,* Mona Semsarilar and Marc Cretin



269

A secondary structure within small peptides guiding spontaneous self-aggregation and nanoparticle formation

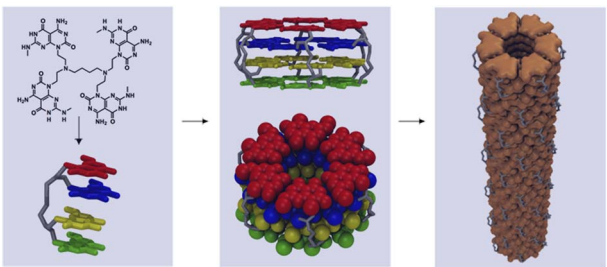
Daniel Martínez-Flores, Alicia Sampieri, Alan Juárez-Barragán, Armando Hernández-García and Luis Vaca*



281

Self-assembled rosette nanotubes from tetra guanine-cytosine modules

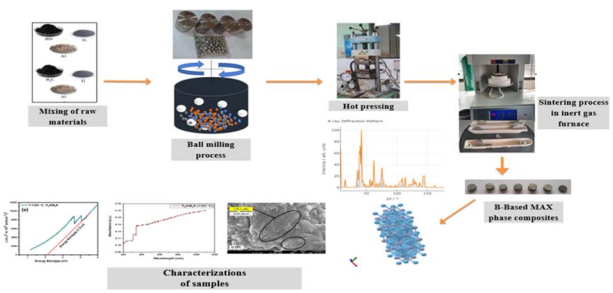
Usha D. Hemraz,* Takeshi Yamazaki, Mounir El-Bakkari, Jae-Young Cho and Hicham Fenniri*



288

Exploring semiconductor potential: novel boron-based Ti_3AlC_2 and Ti_4AlN_3 MAX phase composites with tunable band gaps

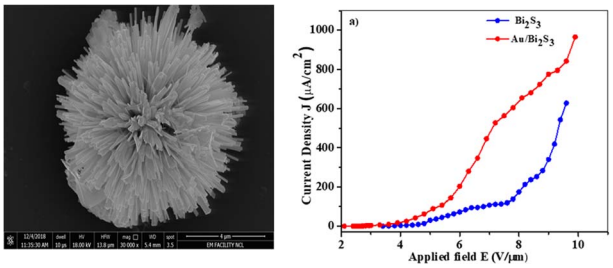
Md. Shahinoor Alam,* Mohammad Asaduzzaman Chowdhury, Md. Saiful Islam, Md. Moynul Islam, Md. Abdus Sabur and Md. Masud Rana



Open Access Article. Published on 17 December 2024. Downloaded on 2/12/2026 1:15:36 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

PAPERS

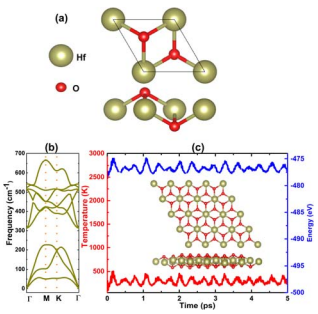
310



Enhanced field emission performance of gold nanoparticle decorated Bi_2S_3 nanoflowers

Gorkshnath H. Gote, Madhura P. Deshpande, Somnath R. Bhopale, Mahendra A. More,* Raphael Longuinhos Monteiro Lobato, Jenaina Ribeiro-Soares and Dattatray J. Late*

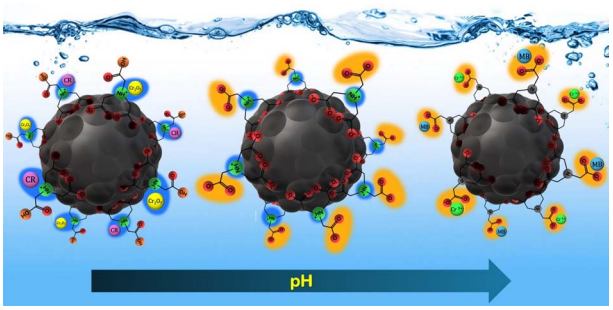
320



Electronic and magnetic properties of the HfO_2 monolayer engineered by doping with transition metals and nonmetal atoms towards spintronic applications

Nguyen Thi Han, J. Guerrero-Sanchez and D. M. Hoat*

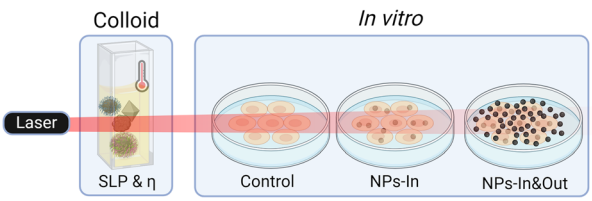
329



Charge-switchable zwitterionic nanomagnets for wastewater remediation

Sohel Reja* and Sukumaran Vasudevan

336



Key factors influencing magnetic nanoparticle-based photothermal therapy: physicochemical properties, irradiation power, and particle concentration *in vitro*

Yilian Fernández-Afonso, Laura Asín, Juan Pardo, Raluca M. Fratila, Sabino Veintemillas, M. Puerto Morales* and Lucía Gutiérrez*

This journal is © The Royal Society of Chemistry 2025

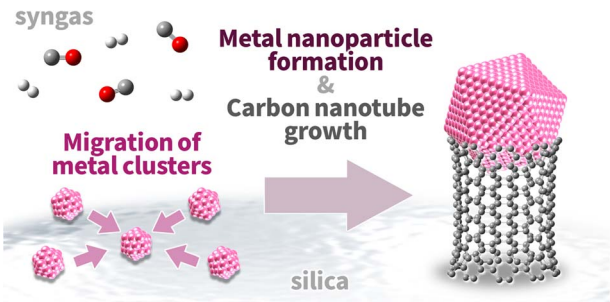
Open Access Article. Published on 17 December 2024. Downloaded on 2/12/2026 1:15:36 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

PAPERS

346

Carbon nanotube growth catalyzed by metal nanoparticles formed *via* the seed effect of metal clusters

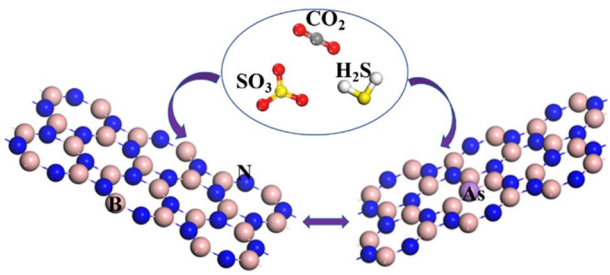
Tatsuya Moriai, Takamasa Tsukamoto,* Kaori Fukuhara, Takane Imaoka, Tetsuya Kambe and Kimihisa Yamamoto*



354

First-principles investigations of As-doped tetragonal boron nitride nanosheets for toxic gas sensing applications

Kamal Hossain, Mohammad Tanvir Ahmed,* Rabeya Akter Rabu and Farid Ahmed



EXPRESSION OF CONCERN

370

Expression of concern: *In situ* growth of N-doped carbon nanotubes from the products of graphitic carbon nitride etching by nickel nanoparticles

Mariusz Pietrowski,* Emilia Alwin, Michał Zieliński, Sabine Szunerits, Agata Suchora and Robert Wojcieszak*

CORRECTION

371

Correction: Mn-ferrite nanoparticles as promising magnetic tags for radiofrequency inductive detection and quantification in lateral flow assays

Vanessa Pilati,* María Salvador, Leyre Bei Fraile, José Luis Marqués-Fernández, Franciscarlos Gomes da Silva, Mona Fadel, Ricardo López Antón, María del Puerto Morales, José Carlos Martinez-García and Montserrat Rivas

RETRACTION

372

Retraction: Unique and outstanding catalytic behavior of a novel MOF@COF composite as an emerging and powerful catalyst in the preparation of 2,3-dihydroquinazolin-4(1*H*)-one derivatives

Mohammad Ali Ghasemzadeh* and Boshra Mirhosseini-Eshkevari

Open Access Article. Published on 17 December 2024. Downloaded on 2/12/2026 1:15:36 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

This journal is © The Royal Society of Chemistry 2025